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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,963

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Hiroyuki Nagasaka

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OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER

ASFAW, MESFIN T

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,963	Applicant(s) NAGASAKA ET AL.	
	Examiner Mesfin T. Asfaw	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/05/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lof et al., [US 20040160582 A1, hereinafter referred as Lof] in view of Hall et al. [US 6581438 B1, hereinafter referred as Hall].

As per Claims 1, 4, 9, 11, 13, 14, Lof teaches a substrate holding device WT (See fig. 4) which holds a substrate w to be exposed through a liquid 11 (Abstract), comprising:

a holder WT which holds the substrate w;

a predetermined surface (the vertical surface of edge seal member 117) which faces a side surface of the substrate held on the holder (and the primary surface of the edge member is substantially coplanar with the primary surface of the substrate and surrounds a position on the substrate table (Para 21)) via a predetermined gap and is liquid-repellent (Para 25, "a hydrophobic layer"); and

the side surface of the substrate is provided with a liquid-repellent area which is liquid-repellent (Para 179, "coat the substrate W edges with a hydrophobic material").

Lof does not specifically teach a chamfered portion formed on an upper portion of the predetermined surface, wherein the chamfered portion is provided to face the liquid-repellent area of the substrate held on the holder.

Hall teaches system for visualizing and quantifying capillary flow of liquids under realistic conditions and figure 1B shows a schematic cross-section view of a common braze joint geometry comprising two flat surfaces butted together, where a fillet has formed between two surfaces oriented at a chamfered angle less than 90 degrees to each other (e.g., at 45 degrees) so as to the chamfered portion is provided to face the surface area.

Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to incorporate a chamfered portion formed on an upper portion of the predetermined surface, wherein the chamfered portion is provided to face the liquid-repellent area of the substrate held on the holder in the teaching of Lof in order to form a low flow rate of liquid down through the gap due to capillary action (Para 25).

As per Claims 2-3, 6-7 and 10, Lof in view of Hall teaches the substrate holding device as claimed.

Lof in view of Hall does not specifically teach a depth of the chamfered portion which is set according to the liquid-repellent area of the substrate coated on a base material but not on the back surface of the substrate, and a lower end of the chamfered portion that is set at a position higher than a lower end of the liquid-repellent area of the

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substrate and angle of contact between the two surfaces and the liquid to be greater than 180 degrees.

However Lof teaches a predetermined surface which is a liquid repellent and a substrate facing a side of the predetermined surface which is also having a liquid repellent surface. Hall teaches two flat surfaces butted together, where a fillet has formed between two surfaces oriented at a chamfered angle.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to come up with a workable structure such as a depth of the chamfered portion which is set according to the liquid-repellent area of the substrate coated on a base material but not on the back surface of the substrate, and a lower end of the chamfered portion that is set at a position higher than a lower end of the liquid-repellent area of the substrate with angle of contact between the two surfaces and the liquid to be greater than 180 degrees, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious variation of liquid repellent surface structure.

As per Claims 5 and 8, Lof in view of Hall teaches a substrate holding device which holds a substrate to be exposed through a liquid and a predetermined surface with a chamfered angle, which faces a side surface of the substrate held on the holder via a predetermined gap.

Lof in view of Hall does not explicitly teach a thickness of the substrate is approximately 0.775 mm, and a depth of the chamfered portion is not more than 0.5 mm and the predetermined gap is 0.1 to 0.5 mm.

However, Lof teaches a substrate with a thickness tolerance of about 25 μm though the embodiment can account for up to about 0.2 mm variation (Para 115) and it can be arranged such that the gap between the edge seal member and the substrate can be varied and/or the height of the primary surface of the edge seal member can be varied to accommodate variations in substrate height or thickness (Para 21).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to come up with a workable range, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious variation of substrate thickness and predetermined gap between structures and their shapes, used to provide any desirable result of liquid flow prevention.

Furthermore, in the instant application, Para 72, 77 and 78, applicant has not disclosed any criticality of the claimed limitations, thus it would have been an obvious modification of Lof in view of Hall in order to obtain optimum prevention of liquid loss when edge portions of the substrate or other object are, for example, imaged or illuminated.

As per Claim 12, Lof teaches sectional shapes of an upper side portion and a lower side portion of the substrate are arced (See fig. 4).

As per Claims 15-22 and 38, Lof in view of Hall teaches an exposure and device manufacturing method as claimed, because under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claims, then the method claimed will be considered to be anticipated by the prior art

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device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324,231 MPEP 2112.02”

As per Claims 23-24, Lof teaches a plate member (See fig. 4) which is held by vacuum suction by the substrate holding device and is releasable (Para 115), used in an exposure apparatus which exposes a substrate w held on a substrate holding device WT by irradiating a surface of the substrate with an exposure light beam through a liquid 11 (Abstract), the plate member comprising:

a predetermined surface (the vertical surface of edge seal member 117) which faces a side surface of the substrate held on the substrate holding device via a predetermined gap and which has a liquid-repellency (Para 25, “provide the substrate table with a hydrophobic layer”); and

Lof does not specifically teach a chamfered portion formed on an upper portion of the predetermined surface, wherein the chamfered portion is provided to face the liquid-repellent area on the side surface of the substrate held on the substrate holding device.

Hall teaches system for visualizing and quantifying capillary flow of liquids under realistic conditions and figure 1B shows a schematic cross-section view of a common braze joint geometry comprising two flat surfaces butted together, where a fillet has formed between two surfaces oriented at a chamfered angle less than 90 degrees to each other (e.g., at 45 degrees) so as to the chamfered portion is provided to face the surface area.

Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to incorporate a chamfered portion formed on an upper portion of the predetermined surface, wherein the chamfered portion is provided to face the liquid-repellent area on the side surface of the substrate held on the substrate holding device, in the teaching of Lof in order to form a low flow rate of liquid down through the gap due to capillary action (Para 25).

As per Claims 25-27 and 29, Lof in view of Hall teaches a plate member as claimed.

Lof in view of Hall does not specifically teach a depth of the chamfered portion which is set according to the liquid-repellent area of the substrate, and a lower end of the chamfered portion that is set at a position higher than a lower end of the liquid-repellent area of the substrate and angle of contact between the two surfaces and the liquid to be greater than 180 degrees.

However Lof teaches a predetermined surface which is a liquid repellent and a substrate facing a side of the predetermined surface which is also having a liquid repellent surface. Hall teaches two flat surfaces butted together, where a fillet has formed between two surfaces oriented at a chamfered angle.

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to come up with a workable structure such as a depth of the chamfered portion which is set according to the liquid-repellent area of the substrate, and a lower end of the chamfered portion that is set at a position higher than a lower end of the liquid-repellent area of the substrate with angle of contact between the two

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surfaces and the liquid to be greater than 180 degrees, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious variation of liquid repellent surface structure.

As per Claim 30, Lof in view of Hall teaches a plate member and a predetermined surface with a chamfered angle, which faces a side surface of the substrate held on the holder via a predetermined gap.

Lof in view of Hall does not explicitly teach the predetermined gap is 0.1 to 0.5 mm.

However, Lof teaches it can be arranged such that the gap between the edge seal member and the substrate can be varied and/or the height of the primary surface of the edge seal member can be varied to accommodate variations in substrate height or thickness (Para 21).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to come up with a workable range, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious variation of predetermined gap between structures and their shapes, used to provide any desirable result of liquid flow prevention.

Furthermore, in the instant application, Para 78, applicant has not disclosed any criticality of the claimed limitations, thus it would have been an obvious modification of

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Lof in view of Hall in order to obtain optimum prevention of liquid loss when edge portions of the substrate or other object are, for example, imaged or illuminated.

As per Claims 31-35 and 37, Lof teaches a substrate holding device WT (See fig. 4) which holds a substrate w to be exposed through a liquid 11 (Abstract), comprising:

a holder WT which holds the substrate w;

a predetermined surface (the vertical surface of edge seal member 117) which faces a side surface of the substrate held on the holder via a gap and is liquid-repellent (Para 25, "a hydrophobic layer" same material as the substrate surface), wherein

the predetermined surface includes a flat portion which is substantially parallel to the side surface of the substrate held on the holder (See fig. 4).

Lof does not specifically teach a chamfered portion which extends to a position above the flat portion, and a sum of a contact angle of the side surface of the substrate with the liquid and a contact angle of the flat portion of the predetermined surface with the liquid is greater than 180 degrees.

Hall teaches system for visualizing and quantifying capillary flow of liquids under realistic conditions and figure 1B shows a schematic cross-section view of a common braze joint geometry comprising two flat surfaces butted together, where a fillet has formed between two surfaces oriented at a chamfered angle less than 90 degrees to each other (e.g., at 45 degrees).

Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to incorporate a chamfered portion which extends to a position

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above the flat portion, and a sum of a contact angle of the side surface of the substrate with the liquid and a contact angle of the flat portion of the predetermined surface with the liquid is greater than 180 degrees, in the teaching of Lof in order to form a low flow rate of liquid down through the gap due to capillary action (Para 25).

Furthermore, in the instant application, Para 21, applicant has not disclosed any criticality of a sum of a contact angle of the side surface of the substrate with the liquid and a contact angle of the flat portion of the predetermined surface with the liquid to be greater than 180 degrees, thus it would have been an obvious modification of Lof in view of Hall in order to obtain optimum prevention of liquid loss when edge portions of the substrate or other object are, for example, imaged or illuminated.

As per Claim 36, Lof in view of Hall teaches a substrate holding device which holds a substrate to be exposed through a liquid and a predetermined surface with a chamfered angle, which faces a side surface of the substrate held on the holder via a predetermined gap.

Lof in view of Hall does not explicitly teach a thickness of the substrate is approximately 0.775 mm, and a depth of the chamfered portion is not more than 0.5 mm.

However, Lof teaches a substrate with a thickness tolerance of about 25 μm though the embodiment can account for up to about 0.2 mm variation (Para 115).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to come up with a workable range, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of

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its suitability for the intended use as a matter of obvious variation of substrate thickness and predetermined depth of the chamfered portion and their shapes, used to provide any desirable result of liquid flow prevention.

Furthermore, in the instant application, Para 72, 77, applicant has not disclosed any criticality of the claimed limitations, thus it would have been an obvious modification of Lof in view of Hall in order to obtain optimum prevention of liquid loss when edge portions of the substrate or other object are, for example, imaged or illuminated.

As per Claim 39, Lof teaches a plate member (See fig. 4) used in an exposure apparatus which exposes a substrate w held on a substrate holding device WT by irradiating an exposure light beam onto a surface of the substrate through a liquid 11 (Abstract), wherein:

the plate member has a predetermined surface (the vertical surface of edge seal member 117) which faces a side surface of the substrate held on the substrate holding device via a predetermined gap (Para 25).

the predetermined surface includes a flat portion which is substantially parallel to the side surface of the substrate held on the holder (See fig. 4).

Lof does not specifically teach a chamfered portion which extends to a position above the flat portion, and a sum of a contact angle of the side surface of the substrate with the liquid and a contact angle of the flat portion of the predetermined surface with the liquid is greater than 180 degrees.

Hall teaches system for visualizing and quantifying capillary flow of liquids under realistic conditions and figure 1B shows a schematic cross-section view of a common

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brazed joint geometry comprising two flat surfaces butted together, where a fillet has formed between two surfaces oriented at a chamfered angle less than 90 degrees to each other (e.g., at 45 degrees).

Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to incorporate a chamfered portion which extends to a position above the flat portion, and a sum of a contact angle of the side surface of the substrate with the liquid and a contact angle of the flat portion of the predetermined surface with the liquid is greater than 180 degrees, in the teaching of Lof in order to form a low flow rate of liquid down through the gap due to capillary action (Para 25).

Furthermore, in the instant application, Para 21, applicant has not disclosed any criticality of a sum of a contact angle of the side surface of the substrate with the liquid and a contact angle of the flat portion of the predetermined surface with the liquid to be greater than 180 degrees, thus it would have been an obvious modification of Lof in view of Hall in order to obtain optimum prevention of liquid loss when edge portions of the substrate or other object are, for example, imaged or illuminated.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mesfin T. Asfaw whose telephone number is 571-270-5247. The examiner can normally be reached on Monday to Friday, 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mesfin T Asfaw/
Examiner, Art Unit 2851

/Diane I Lee/
Supervisory Patent Examiner, Art Unit 2851